

No.

8400002



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

Idaho Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS LOTS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OWNED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

IDAHO FESCUE

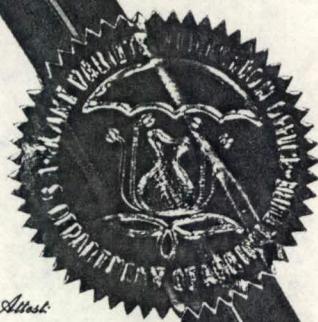
'Nezpurs'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 28th day of September in the year of our Lord one thousand nine hundred and eighty-four.

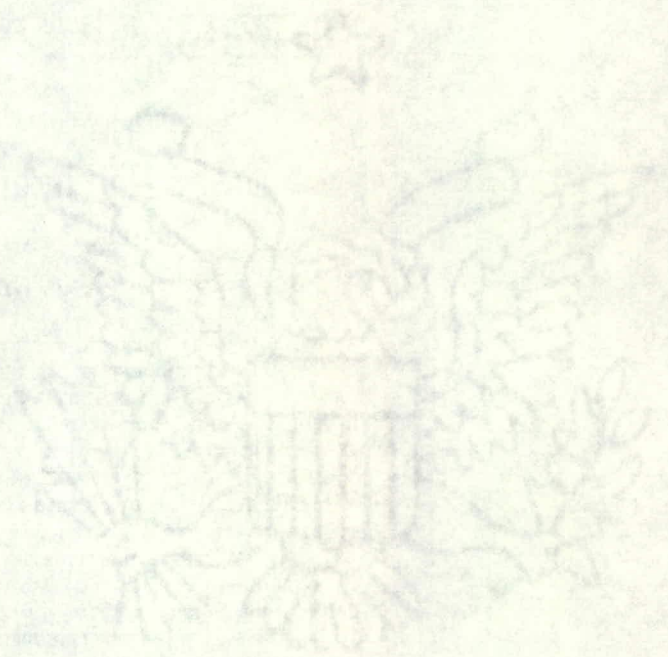
Attest:

*Kenneth H. ...*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*John R. Block*  
Secretary of Agriculture







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U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION

FORM APPROVED: OMB NO. 0581-0005

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1. NAME OF APPLICANT(S) <b>R. D. Ensign Idaho Agricultural Exp. Station</b>		2. TEMPORARY DESIGNATION <b>Syn 'C'</b>		3. VARIETY NAME <b>Nezpurs</b> ✓	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) <b>Dep. Plant, Soils, and Entomological Sci. University of Idaho Moscow, ID 83843</b>		5. PHONE (Include area code) <b>208-885-6531</b>		FOR OFFICIAL USE ONLY VPPO NUMBER <b>8400002</b>	
6. GENUS AND SPECIES NAME <b><u>Festuca idahoensis</u> Elmer</b>		7. FAMILY NAME (Botanical) <b>Gramineae (Poaceae)</b>		FILING DATE <b>10/11/83</b> TIME <b>12:30</b> <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M.	
8. KIND NAME <b>Idaho Fescue</b>		9. DATE OF DETERMINATION <b>June 1983</b>		FEES RECEIVED AMOUNT FOR FILING <b>\$ 1,000</b> DATE <b>10/11/83</b> AMOUNT FOR CERTIFICATE <b>\$ 500.00</b> DATE <b>9/11/84</b>	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) <b>Same as above, Item 1.</b>				12. DATE OF INCORPORATION	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION <b>No</b>				12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS <b>R. D. Ensign, Agronomist and Professor Dep. Plant, Soils, and Entomological Sci. University of Idaho Moscow, ID 83843</b>					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;">           a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)            b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement         </div> <div style="width: 48%;">           c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)            d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of the Variety         </div> </div>					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <div style="display: flex; justify-content: space-between;"> <input checked="" type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below)           <input type="checkbox"/> No         </div>					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> Foundation <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified		
18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S. OR OTHER COUNTRIES? <div style="text-align: right;"> <input type="checkbox"/> Yes (If "Yes," give names of countries and dates)  <input checked="" type="checkbox"/> No         </div>					
19. HAVE RIGHTS BEEN GRANTED IN THE U.S. OR OTHER COUNTRIES? <div style="text-align: right;"> <input type="checkbox"/> Yes (If "Yes," give names of countries and dates)  <input checked="" type="checkbox"/> No         </div>					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT <b>R.D. Ensign</b>				DATE <b>July 1, 1983</b>	
SIGNATURE OF APPLICANT				DATE	



## INSTRUCTIONS

**General:** Send an original copy of the application and exhibits, at least 2,500 viable seeds, and ~~\$500~~ <sup>\$1000</sup> fee (~~\$250~~ <sup>500</sup> filing fee and ~~\$250~~ <sup>500</sup> examination fee) to U.S. Department of Agriculture, Agricultural Marketing Service, Livestock, Meat, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

### Item

- 9 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- 14a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.
- 14b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 14c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.
- 14d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 15 If "Yes" is specified (*seed of this variety be sold by variety name only as a class of certified seed*) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "No," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)
- 16 See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.



## EXHIBIT A

History of the Breeding and Development of  
'Joseph' and 'Nezpurs' Idaho Fescue

The objective of the Idaho fescue (Festuca idahoensis ELMER) breeding and development program was to produce germplasm with improved floret fertility (seed set), seed size (seedling vigor), and higher germination. Idaho fescue has been noted for weakness in these three characteristics. The improved germplasm would produce more seed and more vigorous seedlings. This bunch-type grass may then have a more competitive advantage in re-establishment.

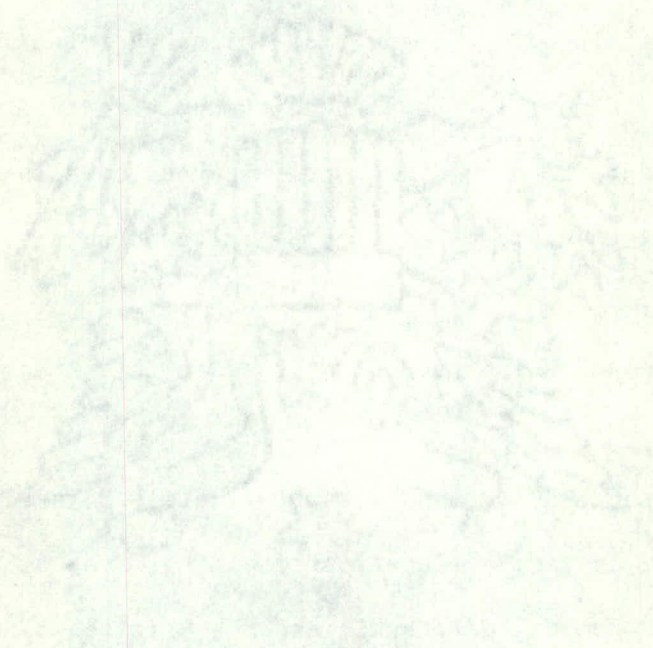
The breeding and selection procedures used in this program are summarized as follows:

Step I: In the 1950's, seed of approximately 89 native ecotypes were collected in various locations in Idaho, Oregon, Washington, Montana, Wyoming, California and the British Columbia and Saskatchewan providences of Canada. A source nursery of approximately 20 plants from each accession was established and the plants were evaluated for several botanical characteristics including floret fertility, seed size, and germination which were considered to be the important components to improve the biological efficiency of the species. It was noted from the early investigations that there was considerable variation among and within ecotypes in these components. The opportunity to select improved germplasm for these characteristics appeared promising.

Step II: A phenotypic recurrent selection breeding program was established whereby outstanding plants were selected based upon floret fertility, seed size, and germination. The basis of these indices were:



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- Floret fertility (seed set ratings) =  $\frac{\text{wt. clean seed/10 panicles} \times 100}{\text{wt. 10 panicles}}$
- Seed size = wt. in grams/200 seeds.
- Percentage Germination = number of seeds germinated, 100/panicle.

Step III:           The initial breeding nursery consisted of 182 progeny rows of 20 spaced plants each. These plants were selected from the source nursery. All plants were indexed for the three criteria described above. About 200 plants within the space planted nursery having the highest index ratings were retained in the nursery to interpollinate the following year. Thus, a majority of the plants were eliminated.

Step IV:           Seeds were harvested from the 200 plants or "clones" described above. This completed the first cycle of phenotypic recurrent selection.

Step V:           The second cycle was initiated by planting enough seeds, from Step V, in the greenhouse for space planting the second intercrossing nursery of 20 plants randomized in 4 replications of 5 plants each. Again, these plants were allowed to interpollinate and index readings were determined. The superior index ratings from the 200 "clones" were determined as in Step III. The clones giving the highest indexes were allowed to interpollinate and seed was harvested to complete the second cycle.

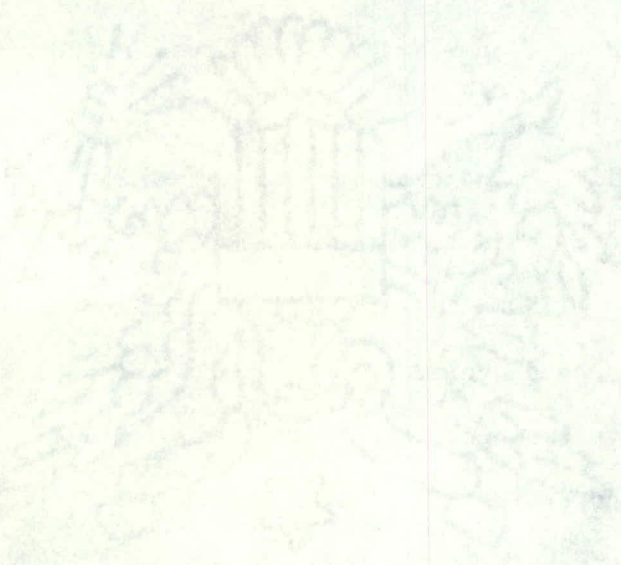
Step VI:           The third cycle of phenotypic recurrent selection was followed as described for the 1st and 2nd cycles.

Step VII:           After three cycles of recurrent selection was completed, 100 high indexed plants were identified. Although four original



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possible synthetic combinations, A, B, C and D, were established, only Syn 'A' and Syn 'C' combinations were maintained in two isolated synthetic nurseries.

Each synthetic nursery consisted of 15 vegetative cuttings of each clone which were space planted in three replications with five plants per replication. The clones were randomized to assure maximum pollination. The two nurseries were isolated from other pollen sources.

Syn 'A', 'Joseph'

This synthetic was a grouping of 13 clones from the 100 clones as identified above. All 13 clones were agronomically uniform in size, pollination dates, seed set potential, maturity and basal growth. They averaged 76 cm in height (range 72-80 cm), had 65% floret fertility, .33 g/200 seeds and germination of 91.4%. This was an 18.2%, 37% and 14% improvement when compared to the original plant ecotypes. (See Table 1).

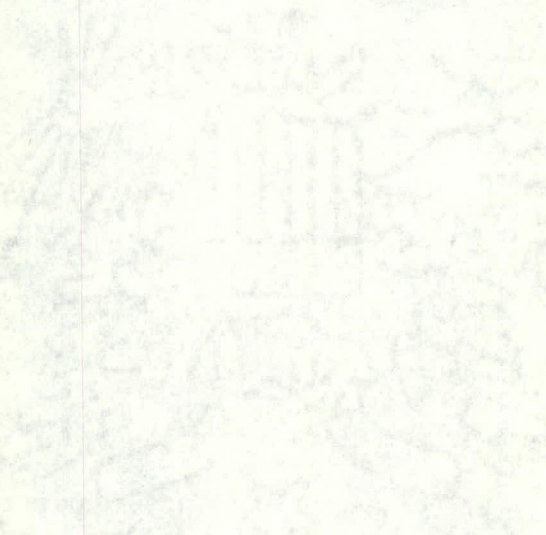
Syn 'C', 'Nezpurs'

This synthetic consisted of 90 clones from the final 100. Syn 'C' was phenotypically more variable than Syn 'A'. There was more variable plant height, clum and panicle color, basal growth and seed produoctivity (see Table 1). Syn 'C' plants are shorter (50-70 cm) and gave less forage yields. See Tables 2-6. Synthetic 'C', although superior in the three selection indices, was more variable as was noted in the original accessions. Some ecologists believe such variability is desirable for a species with such wide distribution and apparent adaptation.



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Step VIII: Syn -1 or Breeders seed, consisting of equal portions of each clone, were harvested in 1981-82.

On June 16, 1982<sup>3, 884 7/6/84</sup> the two cultivars, 'Joseph' and 'Nezpurs' was officially released and accepted for certification in Idaho. A limited generation system of seed certification consists of Breeders, Foundation, and Certified. The Idaho Agricultural Experiment Station will maintain the clones of each cultivar and will be responsible for the Breeders seed production at Moscow, Idaho. The Jacklin Seed Company of Post Falls, Idaho has been contracted to produce Foundation and Certified seed of 'Nezpurs'. and Grasslands West. Seed Co. of Culdesac, Idaho will produce the Foundation and Certified seed of 'Joseph'. They will be responsible for marketing the Certified seeds.

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## EXHIBIT D

## Statement on Variety Stability

Idaho fescue, Festuca idahoensis ELMER is a widely distributed range grass species. Cytologically it's considered to be a polyploid with chromosome counts ranging from 14 to 16 pairs. Chromosome fragments, sometimes referred to as supernumerary chromosomes, are observed. Chromosome behavior among Festucas have been reported by several investigators.

In nature, Idaho fescue ecotypes are found among other fine leaf fescue species. For example, there were seed samples of F. scabrella and F. occidentalis in the early domestic collections for the breeding program. These plants were discarded in the breeding source nursery.

In the three cycles of phenotypic recurrent selection no unusual variants were observed among the populations. Some phenotypic variability characteristic of Idaho fescue was maintained.

'Joseph' and 'Nezpurs' were derived from a heterozygous heterogenous population which have been selected for homogenous characteristics of floret fertility, seedling vigor and germination. The difference between the two cultivars are given in EXHIBIT A and Tables 1 to 6.

In view of the limited three generation seed increase programs for these cultivars i.e. breeders to foundation to Certified seed, we would not expect to see significant change in these cultivars. Identity can also be traced through certification records.

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EXHIBIT B

## NOVELITY STATEMENT

FOR

'Joseph' and 'Nezpurs' Idaho Fescue

'Joseph' and 'Nezpurs' Idaho fescue, Festuca idahoensis, ELMER are the first named cultivars of the species. They were developed in an attempt to improve seed productivity, germination, and seeding vigor. These characteristics are considered to be limiting survival factors among the native ecotypes of Idaho fescue as found throughout the northwest states. Joseph (Syn A) and Nezpurs (Syn C) have been improved significantly in respect to floret fertility (seed set), seed size (vigor) and percent germination in comparison to a collection of the native ecotypes. (See Table 1, Exhibit D).

Joseph and Nezpurs are perennial fescues, have good drought tolerance, the basal leaves are densely tufted, are soft in the spring and fall but stiff during drought periods of the summers. The leaves are distinctive olive-green in comparison to the light to dark green of other fescues. Their leaf texture is similar to Durar hard fescue (Fig. 1b, Exhibit D). The basal tufted leaves of Joseph and Nezpurs resemble Covar sheep fescue and Durar hard fescue except for color. Basal leaf growth is greater for Joseph and Nezpurs than Covar but the leaf lengths are similar (See Table 3, Appendix D). The plant growth habit is erect for Joseph and Nezpurs but not as erect as for Covar and Durar. With respects to plant type (erectness and culm height) Joseph and Nezpurs resemble Highlight chewings fescue more than other fescues.



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The seed culms at maturity of Joseph and Nezpurs are somewhat spreading with open panicles and spikelets at anthesis in contrast to more close spikelets and tight panicles of Covar and Durar (See Fig.'s 6-11, Exhibit D). Dawson red fescue panicles resemble Joseph and Nezpurs to a degree but it has dark green color of panicle basal leaves. The seedling growth of Joseph and Nezpurs compares to Covar and Durar but seedlings are not as vigorous as are 'Secar' bluebunch wheatgrass.

#### Joseph vs. Nezpurs

Joseph is considered a narrow base synthetic of only 13-parental clones whereas Nezpurs is a wide based synthetic composed of 90 clones. The clones of Joseph are more uniform with respect to plant height and basal leaf growth whereas Nezpurs clones are more variable in plant type, plant size, and basal leaf growth. Joseph is 10-17 cm taller, more robust, more basal leaf growth, and slightly later in seed maturity than Nezpurs. The Joseph culms are more open and the larger panicles produce more and larger seeds. Nezpurs have hairs on the palea, longer lemma and awns, and have smaller panicles. (See section 16 in Exhibit C). The two cultivars provide a different degree of genetic variability. Some ecologists prefer the wide plant variability of Nezpurs although each of the parental clones making up Nezpurs were rated superior in floret fertility (seedset), seed size, and percent germination indexes of more than 2,000 plants.



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U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MARYLAND 20705

EXHIBIT C  
(Fine Leaved Fescues)

OBJECTIVE DESCRIPTION OF VARIETY  
FINE LEAVED FESCUES  
(*Festuca spp.*)

NAME OF APPLICANT(S) <b>R. D. Ensign Idaho Agr. Exp. Station</b>	TEMPORARY DESIGNATION <b>Syn 'C'</b>	VARIETY NAME <b>Nezpurs</b>
ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) <b>Plant, Soils, and Entomological Sci. University of Idaho Moscow, Idaho 83843</b>		FOR OFFICIAL USE ONLY PVPO NUMBER <b>8400002</b>

Place the appropriate number that describes the varietal character of this variety in the boxes below. Use leading zeroes when necessary (e.g.,    or   ). Characteristics described including numerical measurements, should represent those that are typical for the variety. Measured data should be for SPACED PLANTS. Royal Horticultural Society or any recognized color fan may be used to determine plant colors; designate system used: The Royal Horticultural Society. Describe location of test area, conditions and number of plants used: Moscow, ID  
Mid-July, semi-arid, 15 plants with similar(11) fine leaf fescues.

1. SPECIES: (With comparison varieties for use below - use varieties within species of application variety)

<input type="text" value="7"/>	1 = <i>F. rubra</i> ssp. <i>commutata</i> (Chewings)	11 = Cascade	12 = Highlight	13 = Jamestown
	2 = <i>F. rubra</i> ssp. <i>litoralis</i> (Creeping Red)	14 = Banner	15 = Barfalla	23 = Merlin
	3 = <i>F. rubra</i> ssp. <i>rubra</i> (Spreading Red)	21 = Dawson	22 = Starlight	
	4 = <i>F. ovina</i> (Sheep)	24 = Pennlawn	32 = Ruby	33 = Fortress
	5 = <i>F. longifolia</i> (Hard)	31 = Boreal	34 = Ensylva	
	6 = <i>F. tenuifolia</i> (Fine-Leaved Sheep)	41 = Covar		
	7 = Other (Specify) <i>F. idahoensis</i> (Joseph)	51 = Durar	52 = Biljart (C-26)	53 = Scaldis
		61 = Panda	62 = Barok	

2. CYTOLOGY:

<input type="text" value="28"/>	Chromosome Number	<input type="text" value="2"/>	Ploidy	1 = diploid	2 = tetraploid	3 = hexaploid
				4 = octoploid		

3. ADAPTATION: (0 = Not Tested; 1 = Not Adapted; 2 = Adapted)

<input type="checkbox"/>	Northeast	<input type="checkbox"/>	Southeast	<input type="checkbox"/>	North Central	<input checked="" type="checkbox"/>	Pacific N.W.	<input type="checkbox"/>	Other (Specify) <u>Montana, British Columbia</u>
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4. MATURITY: Date First Headed (panicle emergence) Location(s) of Trial(s) Moscow, Idaho

<input type="checkbox"/>	Maturity Class:	1 = Very Early (Covar)	2 = Early (Highlight)	3 = Medium Early (Boreal, Dawson)
		4 = Medium Late (Cascade, Ruby)	5 = Late (Jamestown, Agram)	6 = Very Late

Date Headed 5/8- 5/10

<input type="text" value="0"/> <input type="text" value="2"/>	Days earlier than	<input type="text" value="4"/> <input type="text" value="1"/>	} Comparison Variety
	Maturity same as <u>none tested</u>	<input type="text" value=""/> <input type="text" value=""/>	
<input type="text" value=""/> <input type="text" value=""/>	Days later than <u>none tested</u>	<input type="text" value=""/> <input type="text" value=""/>	

5. PLANT HEIGHT: (At maturity; to top of panicle; Average of 10 tallest culms)

<input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="5"/>	mm height	} Comparison Variety
<input type="text" value="2"/> <input type="text" value="0"/> <input type="text" value="8"/>	mm shorter than <u>24</u>	
	Height same as <u>21</u>	
<input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="5"/>	mm taller than <u>53</u>	

6. GROWTH HABIT: (Mature)

<input type="text" value="1"/>	1 = Erect (Ruby)	2 = Semi-erect (Highlight)	3 = Prostrate (Silvana)
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7. RHIZOMES:

<input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/>	mm Length	<input type="text" value=""/> <input type="text" value=""/>	mm Width	<input type="text" value=""/> <input type="text" value=""/>	mm Internode length
<input type="text" value="1"/>	1 = Absent (Highlight)	2 = Weakly Creeping (Dawson)	3 = Strongly Creeping (Boreal)		
	4 = Very Strongly Creeping (Fortress)				



15. GIVE VARIETY OR VARIETIES THAT MOST CLOSELY RESEMBLE THE APPLICATION VARIETY. For the following characteristics indicate Degree of Resemblance by placing the column marked, D.R., one of the following numbers:

- 1 = Application variety is less than comparison variety.      2 = Same As  
3 = More than, better, greater, darker, more disease resistant, etc.

CHARACTER	VARIETY	D.R.	CHARACTER	VARIETY	D.R.
Rhizome Length None	Highlight	2	Growth Habit Basal	Covar	2 (less than Joseph)
Leaf Width	Highlight	2	Leaf Color	Joseph	2
Panicle Color	Joseph	2	Panicle Shape	Joseph	2
Winter Color	Covar	1	Cold Injury	Joseph-Durar	2
Shade Tolerance	NA		Heat	Covar-Joseph	2
Drought	Covar Joseph	2	Disease*	Joseph	2

\* Specify each disease evaluated.

16. ADDITIONAL DESCRIPTION: (Use additional sheets as required)

Describe all characteristics that cannot be adequately described in the form above in Exhibit D. Comparative varieties should be used as may be appropriate, such as for disease. Append all comparative trial and evaluation data, including measured characters, environmental, and disease tests.

The same general comments as given in the first two paragraphs for Joseph section 16 apply to Nezpurs.

In comparing Nezpurs to Joseph the following statements are:

Nezpurs is 1-3 days earlier in maturity.

- " is 135 mm shorter
- " not as open culms in most plants.
- " more color variability in leaf color; lighter green.
- " flag leaf shorter.
- " shorter panicle 130 vs. 150 mm
- " hairs on palea
- " longer lemma
- " longer awns
- " smaller seeds

Nezpurs is a more variable synthetic composed of 90 clones, all rated high in the index of floret fertility, seed size, and germination. The plants are not as uniform in plant type, panicle size and shape, height, maturity and seed production as Joseph. Some plant ecologists consider plant variability plays a role in survival of the species and in this case Nezpurs may have a longer survival index although this has not been tested. Phenotypically Nezpurs is more variable than Joseph and has a much larger genetic base since it is made up of 90 clones.



Table 1. Index readings for two synthetics, Syn 'A' and Syn 'C', of Festuca idahoensis Elmer after three cycles of genotypic recurrent selection

<u>Synthetics</u>	<u>Fertility</u> %	<u>Seed Size</u> g/200 seeds	<u>Germ</u> %
Syn 'A' 13 clones	65	.33	91.4
Range	49-82	.24-39	83-99
Syn 'C' 90 clones	71.7	.31	89
Original clones	55	.24	80
<u>Percent Improvement Over Original Plants</u>			
Syn A	+18.2	+38	+14
Syn C	+30.4	+29	11

BASIS OF INDICES

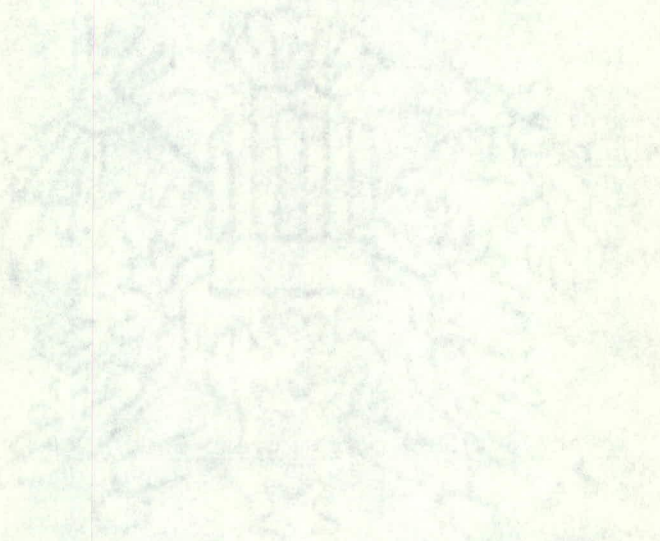
Seed Set Ratings (Floret Fertility =  $\frac{\text{Wt. clean Seed/10 Panicles} \times 100}{\text{Wt. 10 Panicles}}$ )

Seed Size = Wt. in Grams/200 Seeds

Percentage Germination = No. Seeds Germinated/Panicle

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Table 2. Comparative Plant Characteristics of Idaho Fescues  
with other Fescues. 1980-81.

Cultivar	Plant Height	Growth Habit	Maturity	Basal Growth	Forage	Seed Weight	
	--cm--	-type-	--date--	-score-	--g--	plant --g--	panicle --g--
Idaho Fescue, Syn 'A'	72-80	Erect <sup>1</sup>	5/11 <sup>2</sup>	7.0 <sup>3</sup>	718 <sup>4</sup>	20.5 <sup>5</sup>	0.058
Idaho Fescue, Syn 'C'	55-70	Erect	5/10	6.3	194	12.7	0.082
'Covar', Sheep Fescue	60-62	V.Erect	5/12	6.0	68	6.9	0.021
'Durar' Hard Fescue	62-75	V.Erect	5/11	6.8	334	47.6	0.117
'Biljart', Hard Fescue	55-60	Semi-Erect	5/16	8.1	330	15.8	0.027
'Scaldis', Hard Fescue	55-65	Erect	5/11	8.5	378	-	0.047
'Pennlawn', Cr. Red Fescue	75-92	Semi-Erect	5/19	8.9	449	39.1	0.145
'Dawson', Cr. Red Fescue	55-68	Semi-Erect	5/18	8.9	299	29.6	0.063
'Boreal', Dr. Red Fescue	75-80	Erect	5/17	7.5	373	40.1	0.085
'Jamestown', Ch. Red Fescue	65-70	Semi-Erect	5/17	7.0	334	-	0.089
'Cascade', Ch. Red Fescue	80-85	Semi-Erect	5/16	9.0	426	19.3	0.071
'Highlight' Ch. Red Fescue	35-40	Erect	5/17	-	-	-	-

<sup>1</sup> At maturity

<sup>2</sup> At 50% heading; date

<sup>3</sup> 1 little; 9 abundant

<sup>4</sup> Representative spaced plants 80-81

<sup>5</sup> Average of representative plants

8-11-55

1/10/55



Table 3. Comparative Leaf Data of Idaho Fescue With Other Fescues

Cultivar	Leaf				Sheath		Ligule	Auricles	Basal	Basal
	Length	Width	Anthocyanin	Margin	Habit	Color			Hairs	Growth
	--cm--	--mm--	--est--	--est--	--est--	--est--	--est--		--est--	--est--
Idaho Fescue, Syn 'A'	10.0 <sup>1</sup>	2	No <sup>2</sup>	Smooth <sup>3</sup>	Closed	White	Film <sup>4</sup>	none	Fine	7.0 <sup>5</sup>
Idaho Fescue, Syn 'C'	9.6	1	No	Smooth	Closed	White	Film	none	Yes	6.3
'Covar', Sheep Fescue	10.7	1	No	Smooth	Closed	White	Film-Large	none	No	6.0
'Durar', Hard Fescue	10.4	1	No	Smooth	Closed	White	Fleshy	none	No	6.8
'Biljart', Hard Fescue	11.3	1	No	Semi-rough	Open	White	Fleshy	none	Fine	8.1
'Scaldis', Hard Fescue	11.7	1	No	Smooth	Open	White	Film	none	Yes	8.5
'Pennlawn', Cr. Red Fescue	19.5	3	No	Smooth	Closed	White	Fleshy	none	Fine	8.9
'Dawson', Cr. Red Fescue	12.3	2.5	No	Smooth	Closed	White	Film	none	No	8.9
'Boreal', Cr. Red Fescue	12.7	3	No	Smooth	Closed	White	Film-fleshy	none	No	7.5
'Jamestown', Ch. Red Fescue	11.3	3	Yes	Smooth	Open	Red	-	none	No	7.0
'Cascade', Ch. Red Fescue	13.0	2	No	Smooth	Open	White	Flat	none	No	9.0
'Highlight' Ch. Red Fescue	9.8	2	No	Smooth	Open	White	Film-thick	none	Fine	-

<sup>1</sup> Mature Spaced Plants<sup>2</sup> Anthocyanin present or absence<sup>3</sup> Smooth, Semi-Rough, or Rough<sup>4</sup> Filamentous-parchment, fleshy<sup>5</sup> Little, 9 abundant

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Table 4. Comparative Panicle Characteristic of Idaho Fescues With Other Fescues

Cultivar	No/Plant --no--	Seed Yield --g--	Panicle					
			Length --cm--	Shape --est--	Type --est--	Habit --est--	Branches --est--	Color --est--
Idaho Fescue, Syn 'A'	245	0.058	15 <sup>1</sup>	Oblong <sup>2</sup>	Open <sup>2</sup>	Erect <sup>2</sup>	Smooth <sup>3</sup>	O-G <sup>3</sup>
Idaho Fescue, Syn 'C'	380	0.060	13	Oblong	Open	Erect	Smooth	O-G
'Covar', Sheep Fescue	330	0.020	9	Tapering	Compact	Erect	Smooth	B-G
'Durar', Hard Fescue	282	0.117	15	Oblong	Int	Erect	Hairs	L-G
'Biljart', Hard Fescue	576	0.027	9	Oblong	Int	Nodding	Hairs	Purple
'Scaldis', Hard Fescue	300	0.047	16	Egg	Int	Nodding	Smooth	Purple
'Pennlawn', Cr. Red Fescue	263	0.145	21	Oblong	Open	Nodding	Smooth	Green
'Dawson' Cr. Red Fescue	473	0.063	11	Oblong	Int	Nodding	Smooth	Green
'Boreal', Cr. Red Fescue	474	0.085	19	Oblong	Int	Erect	Smooth	Purple
'Jamestown', Ch. Red Fescue	373	0.089	13	Narrow	Compact	Nodding	Smooth	Purple
'Cascade' Ch. Red Fescue	271	0.071	13	Oblong	Open	Nodding	Hairs	P-GR
'Highlight' Ch. Red Fescue	379	--	14	Oblong	Compact	Erect	Smooth	YL-G

<sup>1</sup> Av. Length/Plant<sup>2</sup> At Medium Dough Stage<sup>3</sup> At Maturity; O-G = olive-green, B-G = blue-green; L-G = light-green, YL-G = yellow green

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Table 5. Comparative Seed Data of Idaho Fescue with Other Grasses

Cultivar	Seed Weight			Lemma				Palea Hairs
	Plant	Panicle	1000	Length	Width	Hairs	Awns	
	--g--	--g--	--g--	--mm--	--mm--	--est--	--mm--	--est--
Idaho Fescue, Syn 'A'	14.2	0.058	1.10	5.78	.97	1 <sup>1</sup>	2.86	1 <sup>2</sup>
Idaho Fescue, Syn 'C'	12.7	0.082	.89	6.9	1.2	1	3.88	3
'Secar', Bluebunch Wheatgrass	--	--	2.83	8.06	1.20	1	6.96	1
'Covar', Sheep Fescue	6.9	0.021	0.44	3.76	0.54	2	1.42	2
'Durar', Hard Fescue	47.6	0.117	0.82	5.3	0.83	2	2.04	1
'Biljart', Hard Fescue	15.8	0.027	0.80	5.04	0.87	2	1.94	1
'Scaldis', Hard Fescue	--	0.047	0.79	4.88	0.82	2	2.54	2
'Pennlawn', Cr. Red Fescue	39.1	0.145	1.23	5.9	0.87	1	2.38	2
'Dawson', Cr. Red Fescue	29.6	0.063	1.05	5.2	0.87	1	1.74	1
'Boreal', Cr. Red Fescue	--	0.085	1.62	6.76	0.97	1	3.22	2
'Jamestown', Ch. Red Fescue	--	0.089	0.97	5.10	0.78	1	1.70	2
'Cascade', Ch. Red Fescue	19.3	0.071	1.05	5.11	0.90	3	2.11	2
'Highlight' Ch. Red Fescue	--	--	1.09	5.3	0.98	3	1.86	2

1 = Absent, 2 = Several, 3 = Many

2 = Absent, 2 = Short, 3 = long

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Table 6. Comparative Seedling Characteristics of Idaho Fescue With Other Grasses

Cultivar	Emergence --days--	Coleoptile Length --mm--	Color -est-	Second Leaf -days-	First Leaf -mm-	Root	
						Length --mm--	Score -est-
Idaho Fescue, Syn 'A'	5	5.2	Reddish Brown <sup>1</sup>	11 <sup>2</sup>	32.2 <sup>3</sup>	17	6.0
Idaho Fescue, Syn 'C'	5	5.4	Purplish Brown	6	28	30	8.0
'Secar' Bluebunch Wheatgrass	5	7.8	Purple	10	99	24	8.0
'Covar', Sheep Fescue	7	4.1	Greenish Brown	8	29	20	6.0
'Durar', Hard Fescue	7	4.7	Green	8	40	17	7.0
'Biljart' Hard Fescue	7	4.9	-	8	37	15	6.0
'Scaldis', Hard Fescue	7	3.5	Cream	11	34	22	7.0
'Dawson' Cr. Red Fescue	7	5.3	Greenish Brown	8	33	21	6.0
'Jamestown', Ch. Red Fescue	7	5.3	Light Green	11	30	23	7.0
'Cascade', Ch. Red Fescue	7	5.9	Greenish Brown	11	38	21	7.0

<sup>1</sup> Visual estimation

<sup>2</sup> Days until emergence of second leaf

<sup>3</sup> Length of first leaf at emergence of second leaf

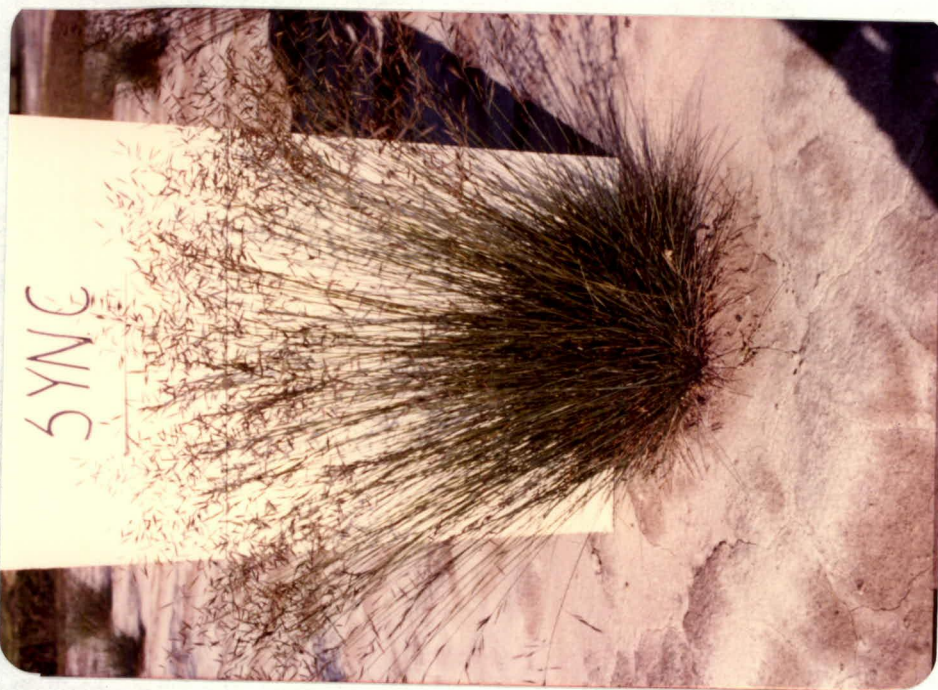
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FIG. 2. IDAHO FESCUE PLANTS IN  
FESCUE COMPARISON NURSERY.



SYN 'A', JOSEPH 6/77



SYN 'C', NEZPURS 6/77

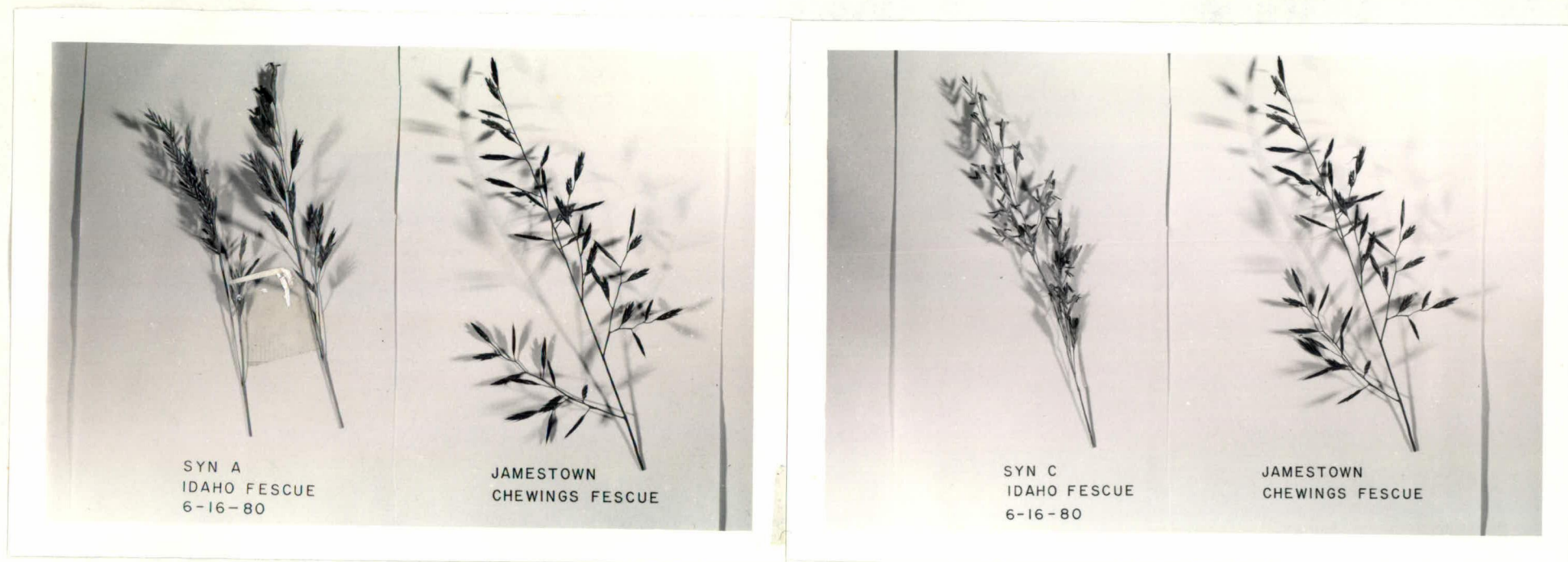
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IDAHO FESCUE PANICLE COMPARISONS  
WITH OTHER FESCUES.

FIG. 6



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FIG. 12. COMPARATIVE SEED SIZE WITH  
OTHER SIMILAR GRASSES

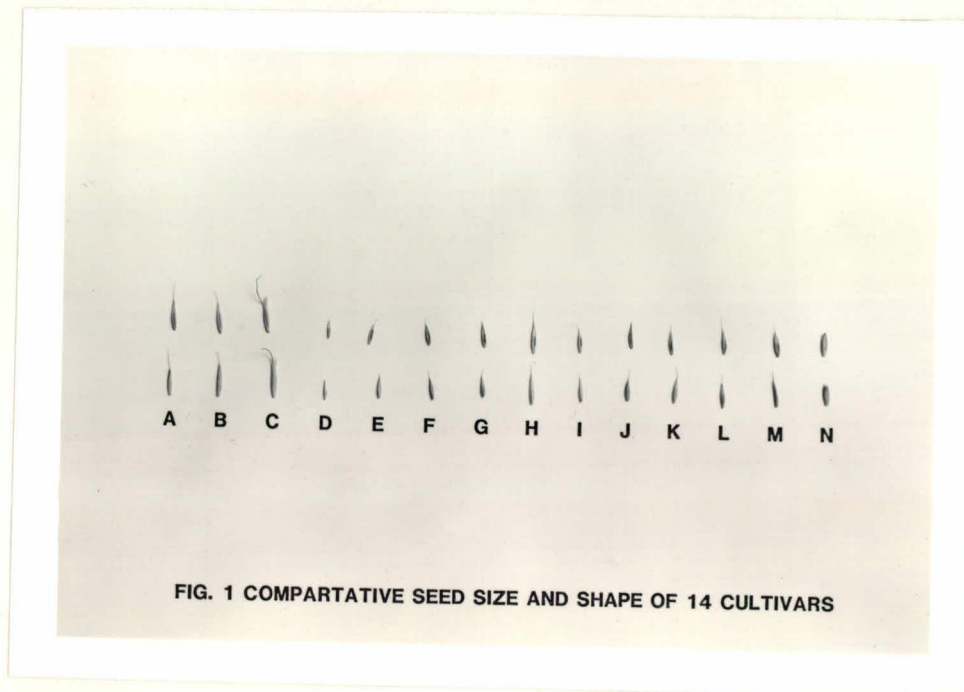


FIG. 1 COMPARTATIVE SEED SIZE AND SHAPE OF 14 CULTIVARS

- A. 'JOSEPH' IDAHO FESCUE
- B. 'NEZPURS' IDAHO FESCUE
- C. 'SECAR' BLUE BUNCH WHEATGRASS
- D. 'COVAR' SHEEP FESCUE
- E. 'DURAR' HARD FESCUE
- F. 'BILJART' HARD FESCUE
- G. 'SCALDIS' HARD FESCUE

- H. 'PENNLAWN' CREEPING RED FESCUE
- I. 'DAWSON' CREEPING RED FESCUE
- J. 'WINTERGREEN' CHEWINGS RED FESCUE
- K. 'JAMESTOWN' CHEWINGS RED FESCUE
- L. 'KOKET' CHEWINGS RED FESCUE
- M. 'CASCADE' CHEWINGS RED FESCUE
- N. 'ALTA' TALL FESCUE

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